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NSLDS II Web Reporting Tutorial

Version 2.1

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Document Control

Version Number	Description	Release Date	Author
1.0	Initial Issue	09/30/2002	Justin M. Miller Allison P. Webster
2.0	Expanded Section 4.5: Manipulating Reports Minor text edits	11/08/2002	Justin M. Miller
2.1	Updated Format	11/13/2002	Jason Patton

1 Introduction

MicroStrategy 7*i* will be used by NSLDS II as a data access tool for reporting. This guide introduces the MicroStrategy 7i Web environment and provides an overview of the functionality available. This guide is not designed to be a comprehensive end-user training guide for MicroStrategy. Rather, its purpose is to cover the important aspects for creating and running reports and to provide a high level understanding of how the tool may be used. It is also important to note that all screenshots are for illustrative purposes and do not represent the official NSLDS II reporting tool, although the final tool should resemble in concept the included screenshots.

The objectives of this guide are as follows:

- Introduce MicroStrategy *7i* Web and key elements such as attributes, facts, metrics, etc.
- Describe how to access and run a canned report.
- Outline the steps needed to construct and run an ad-hoc report.
- Introduce the use of filters and prompts in reports.
- Describe data manipulation options such as drilling techniques, sorting, page by, and formatting functions.

2 Overview of MicroStrategy 7*i* Web

The MicroStrategy 7*i* Web interface allows users to run canned reports as well as create new reports. This interface, which is accessible through a web browser, supports functionality such as ad hoc querying, canned report generation, online report viewing, formatting, and further data analysis through drilling. The HTML / DHTML interfaces deliver this functionality without using any Active X or Java downloads.

Analysis of NSLDS II data will occur within the framework of a NSLDS II project in MicroStrategy. A project can be described as the intersection of a Data Mart, a metadata repository, and a user community. In the NSLDS II instance, the project represents the place where Department of Education personnel and the external financial aid professionals (i.e., schools, lenders, GAs) will access data from the NSLDS II Data Mart using objects stored in the NSLDS II metadata repository. The metadata repository stores definitions and information about the NSLDS II Data Mart, including its logical structure, in schema and reporting objects.

2.1 Key MicroStrategy Objects

MicroStrategy reports are built using a combination of schema objects and report objects. Schema objects are those tied directly to the warehouse, while report objects are those built using schema objects. The key schema objects (attributes, hierarchies, facts) and the key report objects (metrics, filters, prompts) are described below.

Attributes *(Schema Object)*

Attributes represent non-numeric, non-aggregatable data. Information necessary to reference attributes in a MicroStratey report is stored inside the NSLDS II metadata repository. Attributes allow the user to answer questions about a fact and provide context for reporting those facts. Examples of attributes in NSLDS II would be Student Name, School Code, or Loan Number. The data returned in the report data set are known as attribute elements. For example, Student SSN would be the attribute name while '111-11-1111' would be the attribute element.

Hierarchies *(Schema Object)*

Hierarchies in the logical data model are groupings of attributes arranged to reflect their relationship with other attributes. For example, the attributes, Year, Quarter, Month, and Date can be grouped to form the Time hierarchy. Attributes in one hierarchy are not directly related to attributes in another hierarchy.

Facts *(Schema Object)*

Facts are numeric and aggregatable fields. They relate numeric data values from the Data Mart to the MicroStrategy reporting environment. Information necessary to retrieve facts from the Data Mart is stored in the NSLDS II metadata repository. Some examples of facts that are stored in NSLDS II include loan balances, loan interest amounts, and GA collection amounts.

Metrics *(Report Object)*

Metrics are defined as analytical calculations performed against stored facts in the database to produce results for decision-making purposes. A simple example of a metric in NSLDS II would be the summation of student loan balances per school or state, or a simple count of a dollar amount.

Filters *(Report Object)*

Filters specify the conditions that the data must meet in order to be included in the result sets. The filter is roughly equivalent to the WHERE clause in a SQL statement.

Prompts *(Report Object)*

Prompts are used to dynamically modify the contents of a report. With prompts, the user can determine at run-time which attributes or attribute elements to include in the report.

2.2 NSLDS II Project Home Page

Once logged into the NSLDS II project, users will be presented with several navigation options. The table below describes the purpose of each option.

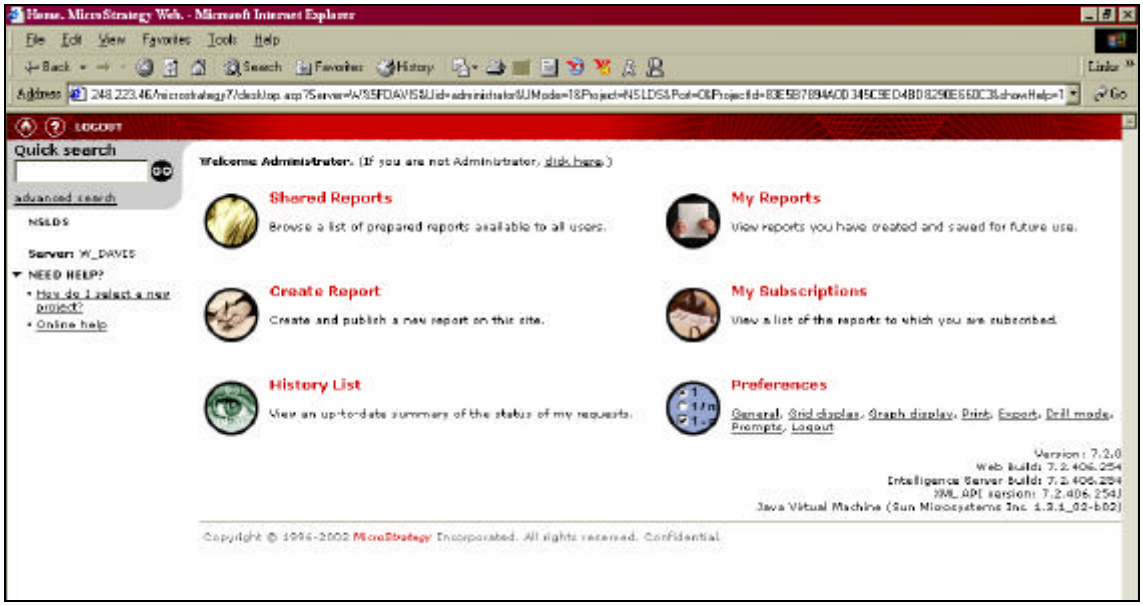


Figure 1, NSLDS II Project Home Page

Option	Purpose
Shared Reports	Allows user to browse a list of canned reports available to execute. Note: Depending on the security privileges assigned, each user may access different reports.
My Reports	Allows user to view reports the user has created and saved.
Create Report	Allows user to create a new report.
My Subscriptions	Allows user to view a list of reports to which the user has subscribed. Note: Within the NSLDS II project, users could have the ability to subscribe to receive reports at scheduled times.
History List	Allows user to view an up-to-date status summary of report requests.
Preferences	Allows user to select preferences such as report display, exporting, printing, etc.

Other main aspects of the MicroStrategy reporting tool, such as toolbars and navigation features, are incorporated throughout the remainder of this document.

3 MicroStrategy Canned Reports

Using the NSLDS II project, users will have the ability to access and run prepared reports. Depending on whether the report is a shared report or a personal report, the user would click on either the "Shared Reports" or the "My Reports" icon. In the example that follows, the user will execute a shared report called Student Date of Birth.

3.1 Running a Canned Report

To run a report that has already been created, the following steps must be executed:

Step 1: Select Report Location

In this example, click on the **Shared Reports** icon.

Figure 2, Shared Reports Icon

The **Shared Reports** folder will open and display the available reports.

Note: It is possible to group reports into folders within Shared Reports, but for the purpose of this example, all of the available reports are displayed without using sub-folders.

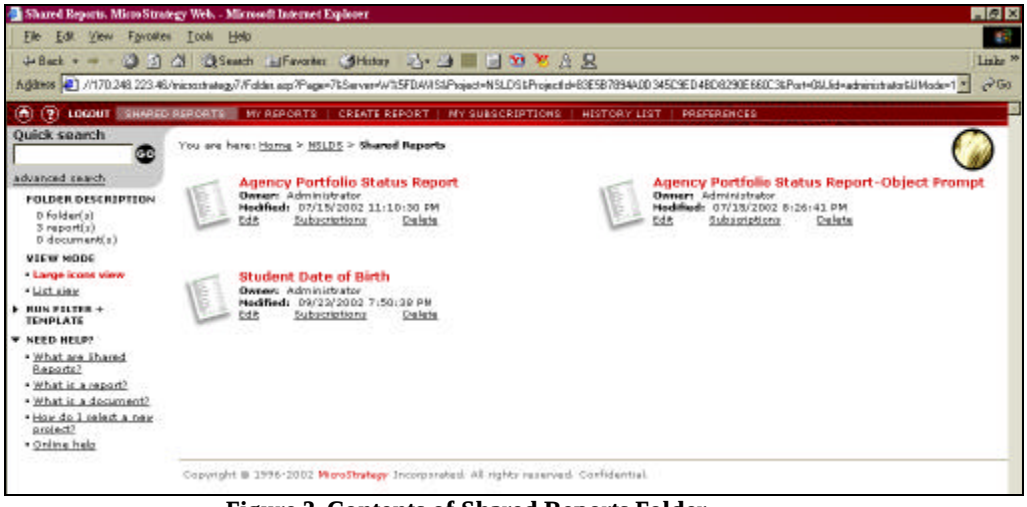


Figure 3, Contents of Shared Reports Folder

Step 2: Select and Execute Report

Click on the **Student Date of Birth** report icon.

The report will begin execution and the wait page will appear.

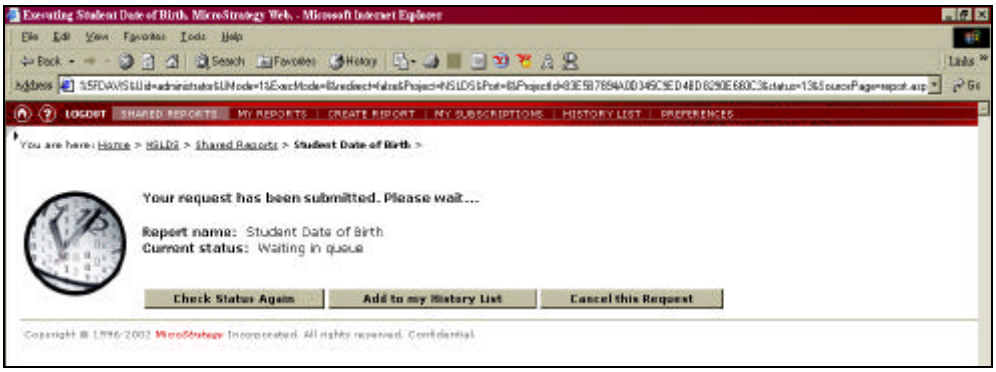
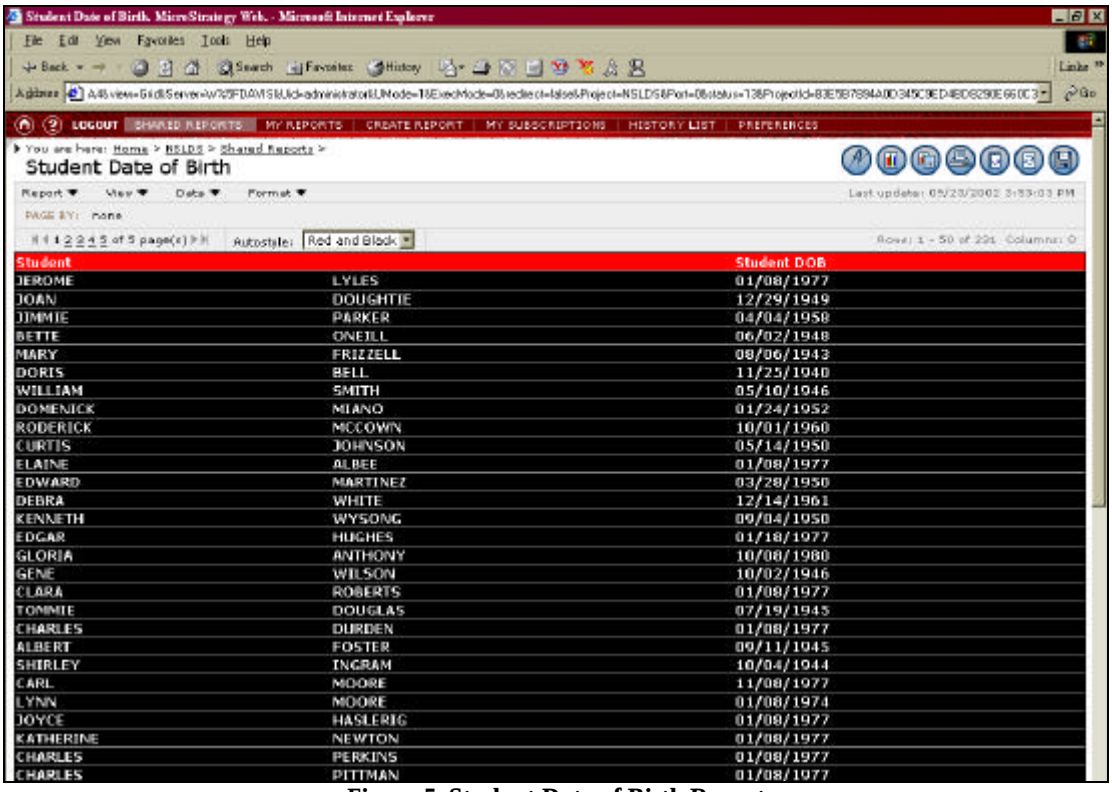


Figure 4, Wait Page

Note: If the user were required to enter parameters for the report, the prompting questions would appear before the report is executed. See Section 4.4: Running Reports with Prompts to see an overview of this process.

Once the report is finished executing, the Student Date of Birth report appears.



Student		Student DOB
JEROME	LYLES	01/08/1977
JOAN	DOUGHTIE	12/29/1949
JIMMIE	PARKER	04/04/1958
BETTE	ONEILL	06/02/1948
MARY	FRIZZELL	08/06/1943
DORIS	BELL	11/25/1940
WILLIAM	SMITH	05/10/1946
DOMENICK	MIANO	01/24/1952
RODERICK	MCCOWN	10/01/1960
CURTIS	JOHNSON	05/14/1950
ELAINE	ALBEE	01/08/1977
EDWARD	MARTINEZ	03/28/1950
DEBRA	WHITE	12/14/1961
KENNETH	WYSONG	09/04/1950
EDGAR	HUGHES	01/18/1977
GLORIA	ANTHONY	10/08/1980
GENE	WILSON	10/02/1946
CLARA	ROBERTS	01/08/1977
TOMMIE	DOUGLAS	07/19/1945
CHARLES	DURDEN	01/08/1977
ALBERT	FOSTER	09/11/1945
SHIRLEY	INGRAM	10/04/1944
CARL	MOORE	11/08/1977
LYNN	MOORE	01/08/1974
JOYCE	HASLERIG	01/08/1977
KATHERINE	NEWTON	01/08/1977
CHARLES	PERKINS	01/08/1977
CHARLES	PITTMAN	01/08/1977

Figure 5, Student Date of Birth Report

3.2 Reporting Toolbar

Once the data set has appeared, a reporting toolbar becomes accessible to the user. The user can use this toolbar to perform a variety of tasks, which are described in the chart below.

Report Toolbar: Buttons and Descriptions

Name	Button	Description
Design Mode		Allows the user to create or modify a report by adding or editing the attributes, metrics, prompts, and filters on the design grid.
Grid		Displays the report in column and row grid format.
Graph		Displays the report in graph mode.
Grid and Graph		Displays the report in both graph and grid mode.
Print		Allows the user print the report.
Refresh Data		Re-executes the report and overrides any existing cache.
Save		Allows the user to save the report.

The user also has the ability to perform data manipulations, such as sorting, rearranging the data columns, etc., once the report result set is formed. See Section 4.5: Manipulating Reports for more detail on these options.

4 MicroStrategy Ad-hoc Reports

The MicroStrategy Web tool also allows users to create and execute ad-hoc reports. This section outlines the necessary steps for creating an ad-hoc report.

4.1 Creating a Basic Report

To create a new report, the following steps must be executed:

Step 1: Select Create Report

Click on the **Create Report** icon.

Figure 6, Create Report Icon

The **Create Report** screen will appear.

This screen allows the user to either create a new report, or to select from an option of report builders and wizards. The report builders and wizards are methods to guide the user through the report creation process if they do not want to start building a report from an empty template. For this demonstration, however, the user will create a report using an empty template.

Step 2: Select Method to Create Report

Select the **Create a Report** option button. Then, click the **Next** button directly to the right.

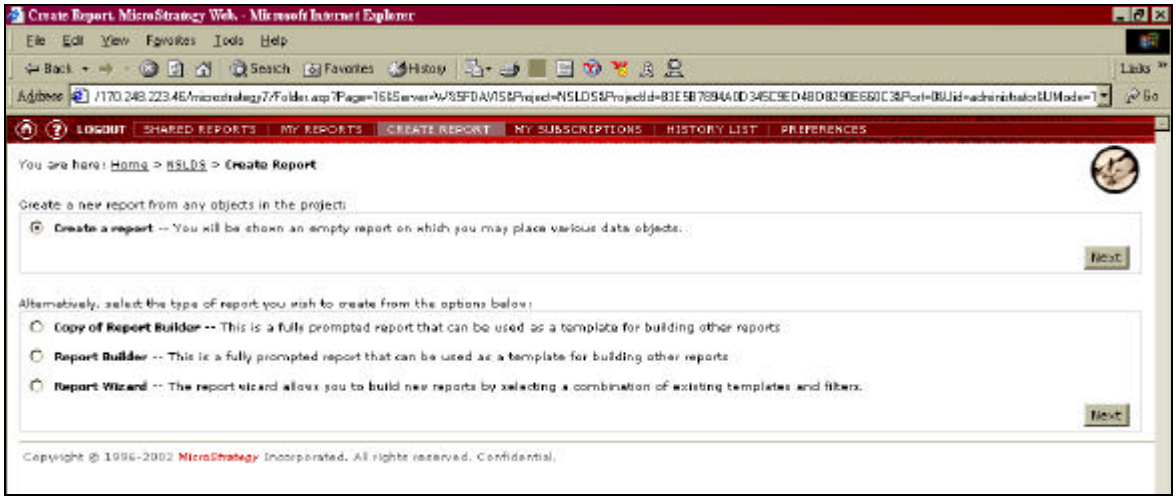


Figure 7, Create Report Screen

The design mode screen will appear.

The design mode allows users to build a report by placing attributes and metrics on the report layout. From design mode, users can browse for the appropriate reporting or schema object using the **All Objects** tab.

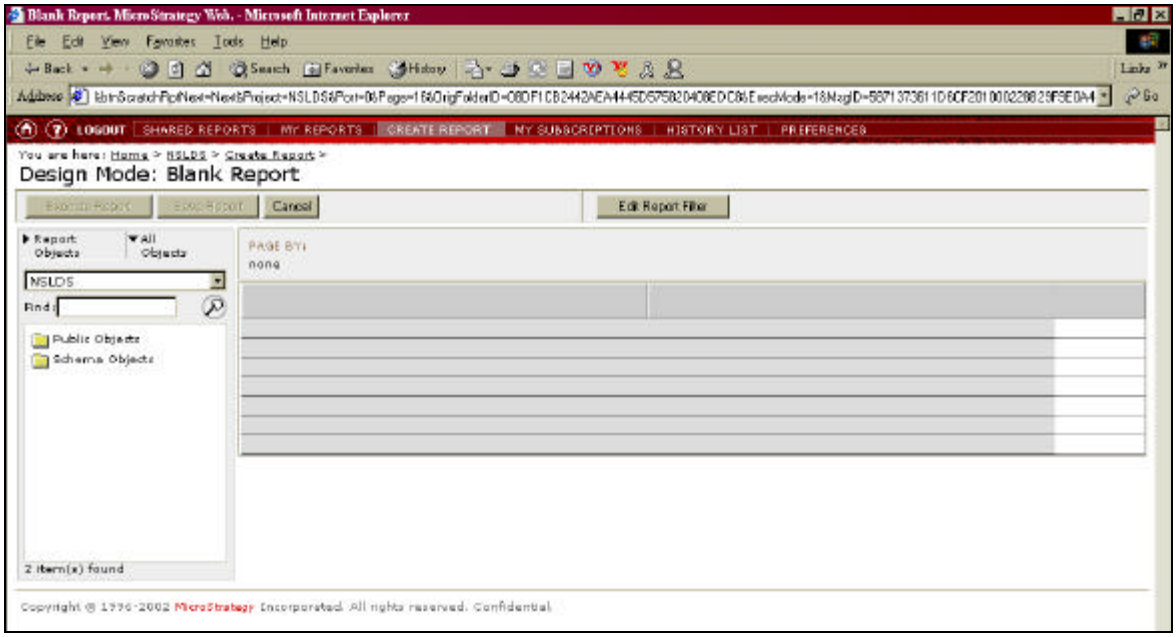


Figure 8, Design Mode

For this example, a report displaying the names of lenders that have issued loans will be created. In addition, for every lender, the student names and their outstanding principal amounts of their loans will be listed. Thus, this report will contain two attributes (lender, student) and one metric (outstanding loan principal balance). The selected attributes and metrics for the report correlate to the SELECT clause in a SQL statement.

Step 3: Search Attribute List

From the **All Objects** tab on the left side of the design screen, click the **Schema Objects** folder, and then the **Attributes** folder.

Every attribute available in the NSLDS II project will be listed.

Figure 9, Available Attributes

Note: It is possible to group attributes into folders and allow the user to search for an attribute, thus minimizing the amount of scrolling the user must perform to locate the correct attribute.

Step 4: Place Attributes on Report

For this example, click on the **Lender** attribute link.

Lender will appear in the report grid column header.

Next, click on the **Student** attribute link.

The **Student** column header will appear to the right of the **Lender** column header.

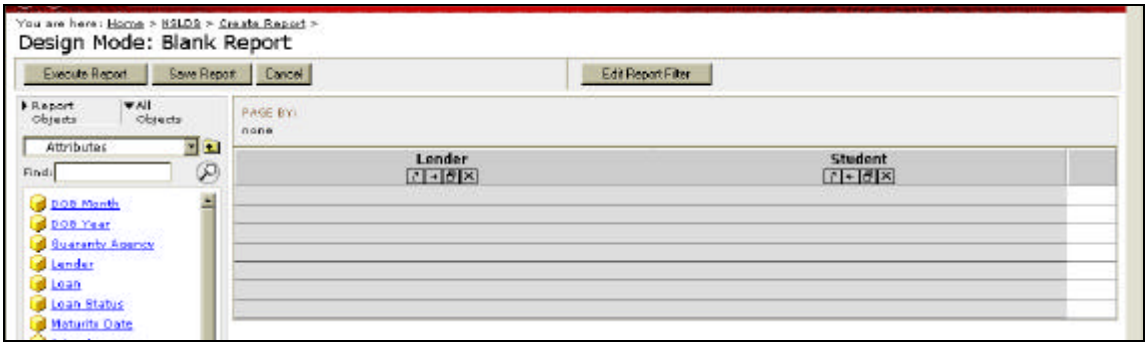


Figure 10, Placing Attributes on the Report Grid

Note: Users can place attributes on reports in three ways, either by clicking on the attribute link, right clicking on the attribute link and selecting Add to Grid, or dragging the attribute onto the report grid.

Step 5: Search Metric List

The process for placing a metric onto a report is essentially the same as that for an attribute.

After navigating back to the NSLDS II project root directory within the **All Objects** tab using the Up Directory icon or using the directory dropdown box, click on the **Metrics** folder.

The available metrics that can be used when creating reports will appear.

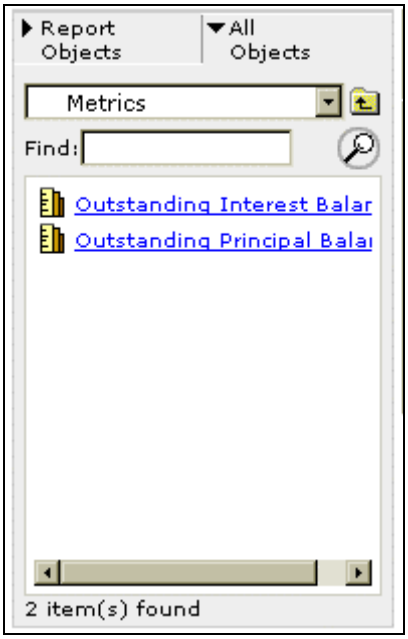


Figure 11, Available Metrics

Step 6: Place Metrics on Report

For this example, click on the **Outstanding Principal Balance** link.

Outstanding Principal Balance will appear in the report grid column header.

Step 7: Execute Report

Once all the attributes and metrics have been selected and placed on the report, click on the **Execute Report** button on the left side of the browser window.

Either the wait screen (as seen in Figure 4) or the **Processing Request** box will appear, depending on the estimated report execution time.

Figure 12, Processing Request

As soon as the report is executed, the report result set will appear online. The report displays data corresponding to the selected attributes and metrics. In the example below, **Lender**, **Student**, and **Outstanding Interest Balance** are displayed.

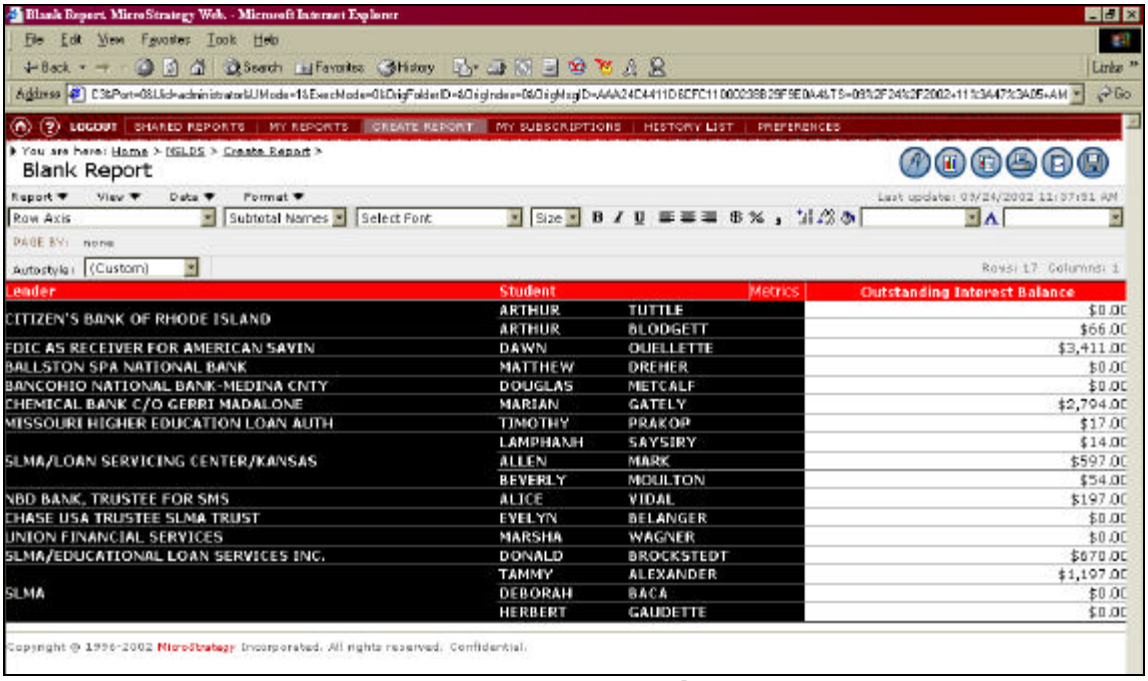


Figure 13, Report Display

Note: Design Mode can still be accessed once the report has been executed if the report needs further editing. The design mode is accessible by clicking on the **Design Mode** icon on the reporting toolbar.

Step 8: Save the Report

Once a report is created, users have the option of saving a report either from the design mode or from the report result set.

In design mode, click on the **Save Report** button near the top of the screen. To save a report in display mode, select the **Report** dropdown and then select **Save As**.

The **Save Report** screen will appear.

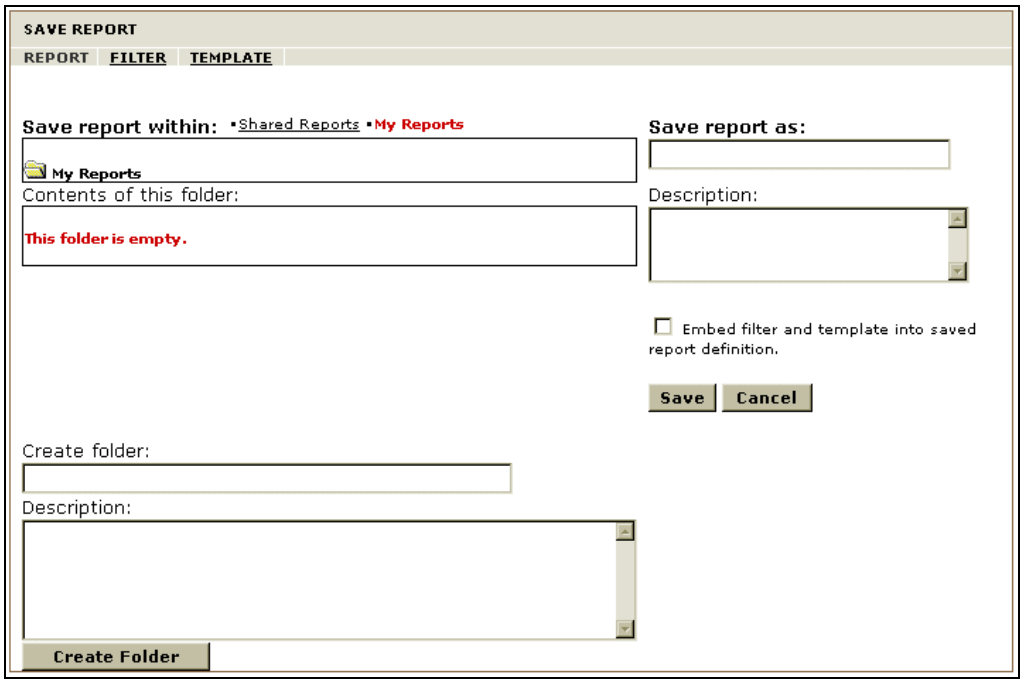


Figure 14, Save Report Screen

To complete the example, the user would enter the report name **Lender Loans** in the **Save report as:** text box. Then the user would click the **Save** button to save the report.

Note: Report descriptions can also be entered on the Save Report Screen as needed. In addition, the user can create new folders within the My Reports folder. Depending on assigned security privileges, users may also have the ability to save reports to sub-folders within the Shared Reports folder in order to publish them to the rest of the user community.

The report will save in the **My Reports** folder and a **Save Confirmation** screen will appear.

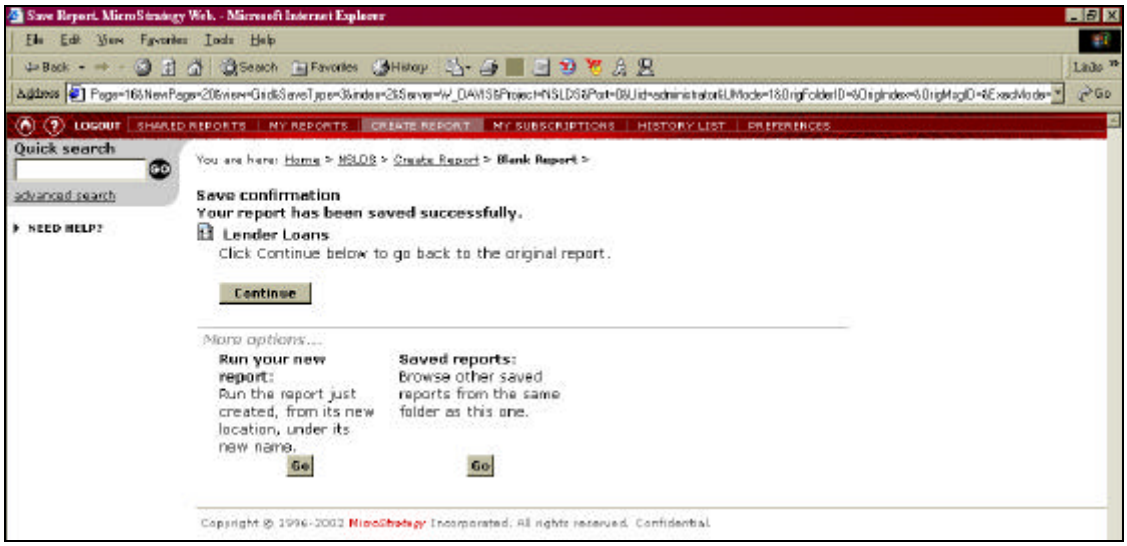


Figure 15, Save Confirmation Screen

From this screen users can use the **Continue** button to navigate back to the report data set, run the report using its new name and location, or browse other saved reports.

4.2 Creating Filters

A filter specifies the condition that the data must meet in order to be included in the report results. A filter resembles the WHERE clause in a SQL statement. Examples of filtering criteria include returning a result set with a certain loan status or returning a list of students whose last name begins with the letter A.

There are two types of filters in MicroStrategy: report filters and view filters. Report filters are applied before the report is executed to limit the data returned in the result set. They can only be added or modified in design mode. View filters, however, limit the data displayed on the result set once the report has been executed and a result set returned. View filters are helpful because the user can adjust the amount and type of data displayed in the result set without having to re-execute the report.

4.2.1 Report Filter

In the following example of a report filter, a report has already been created with the following attributes: **State of Residence, Student,** and **Student Date of Birth**. A report filter will be applied to limit the report result set to information about students who live in Virginia, Tennessee, and Texas.

To add a report filter to a report, the following steps must be followed:

Step 1: Select to Edit Report Filter

Once the attributes and metrics have been selected for the report in design mode, click on the **Edit Report Filter** button near the top of the screen.

An empty report filter will appear.

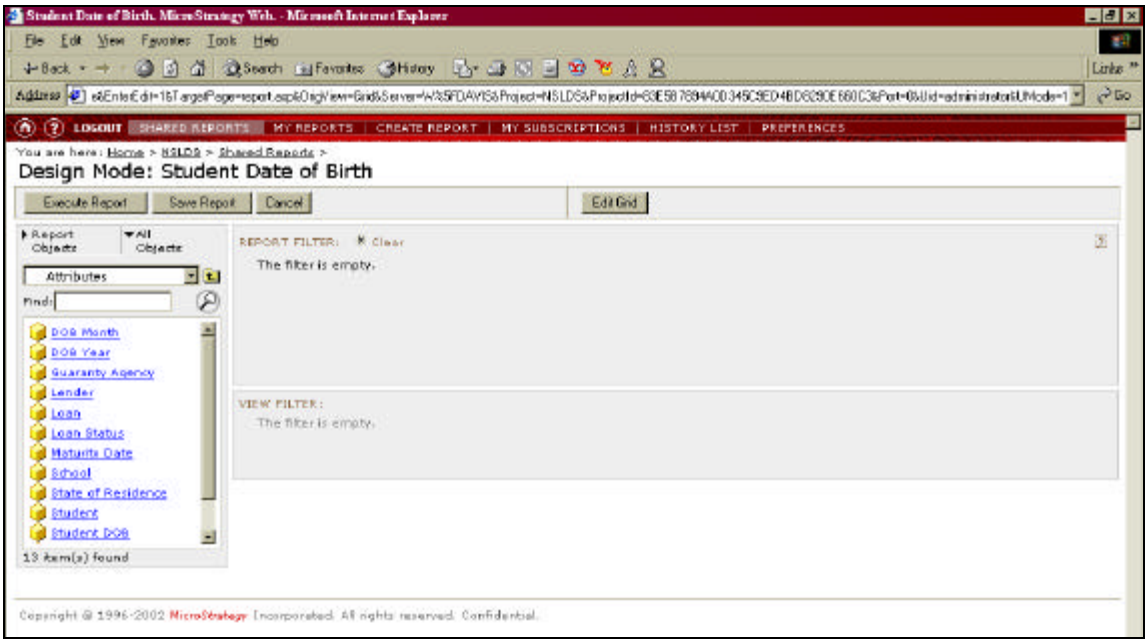


Figure 16, Empty Report Filter

Step 2: Qualify on Attribute or Metric

Select the attribute(s) and / or metric(s) that will be applied as a filter to the report. For this example, click the **State of Residence** attribute link from the **All Objects** window.

The **State of Residence** attribute will be added to the report filter.

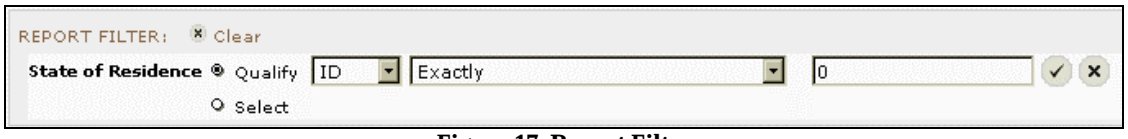


Figure 17, Report Filter

The user has the option of either qualifying on or selecting an attribute. Qualifying on an attribute allows the user to filter on an attribute's ID or description using conditions such as exactly, greater than, between, less than or equal to, etc. and then entering the text or numeric value for the filter. An example of a report filter that qualifies on the State of Residence attribute is as follows: ID exactly VA. Selecting an attribute allows the user to select the filter element from a dropdown list instead of needing to know the exact text or

value to use in the filter. The figure below shows the **State of Residence** select filter. Every state is listed in the dropdown box.

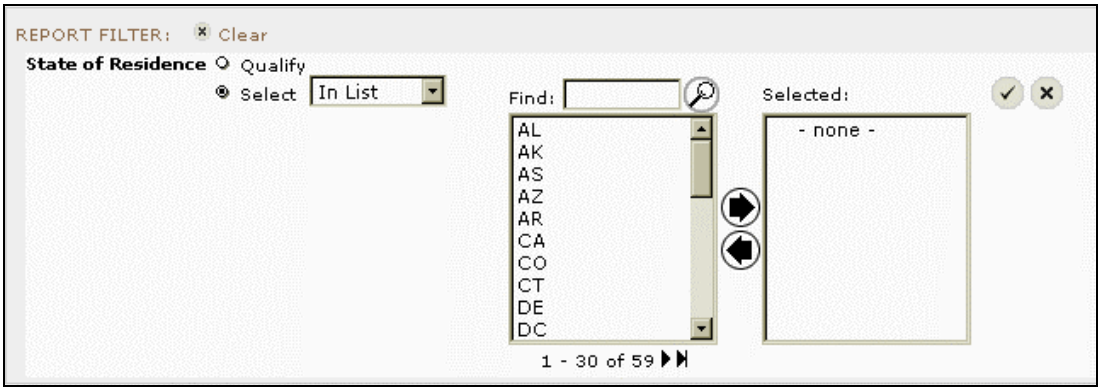


Figure 18, Select Filter

For this example the user would select VA, TN, and TX as the three states by which the report result set should be limited. Then click the right arrow icon to place the three elements in the **Selected** dialog box. Click the check icon to indicate that the filter has been created and should be applied to the report.

Next, the user would click the **Execute Report** button to run the report.

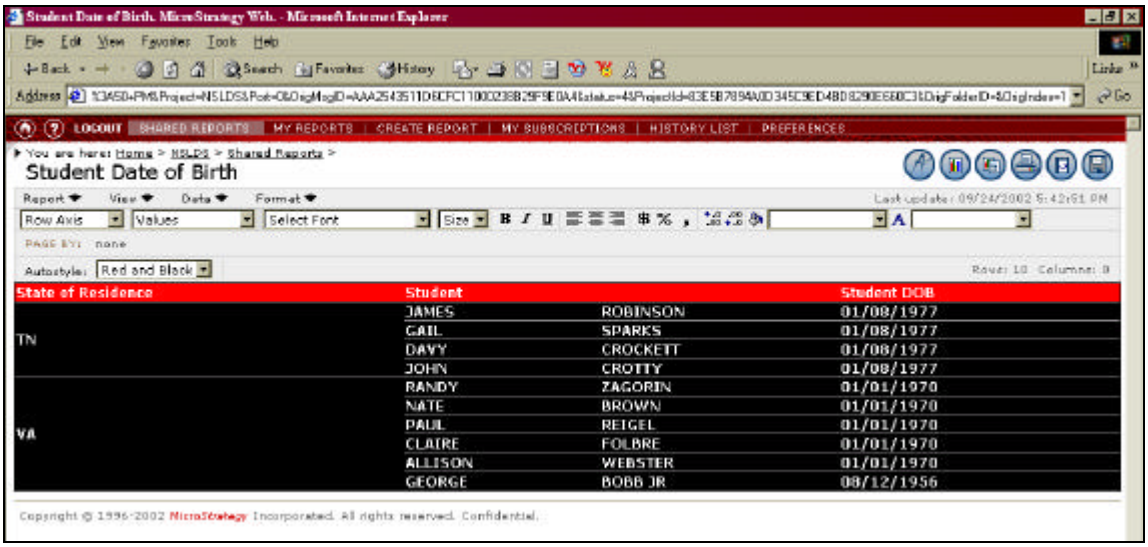


Figure 19, Report with Filter

Once a report with filters is generated, the report result set excludes data not included in the defined filters. In this example, only the states Tennessee and Virginia are displayed since no students living in Texas are in the database.

4.2.2 View Filter

View filters can only be created after the report has been run. To create a view filter in the report display, complete the following steps:

Step 1: Display View Filter

Select the **View** dropdown menu option on the report grid toolbar. Then select **View Filter** option on the dropdown.

An empty view filter will be displayed on the report.

Figure 20, Empty View Filter

Step 2: Add Viewing Condition

To add a viewing condition, click on the **Add Condition** link.

The user is prompted to select the report element that will be used in the filter. In this example for the Student Date of Birth report, these element options are **Student**, **Student Date of Birth,** and **State of Residence**.

Note: Only reporting objects included on the report are available for a view filter.

Select the **State of Residence** option from the dropdown box.

The select filter, which uses the same format as that used for report filters, will open.

For this example, select the states that are to be filtered on: Virginia and Tennessee. Then click on the right arrow icon to place these elements in the **Selected:** dialog box. Notice that Texas is not included in the state dialog box because it was not returned in the original result set.

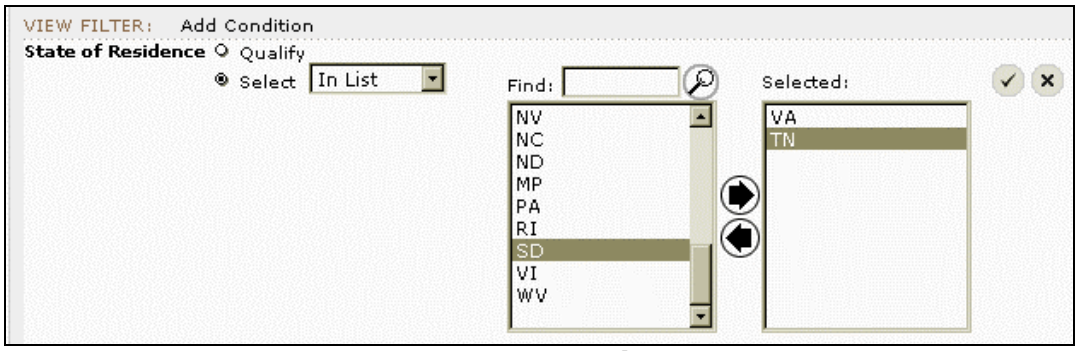


Figure 21, View Filter

Click the check icon to include the filter on the report.

The report result set will return with the view filter executed. In this example, the report will display only students that live in Virginia and Tennessee.

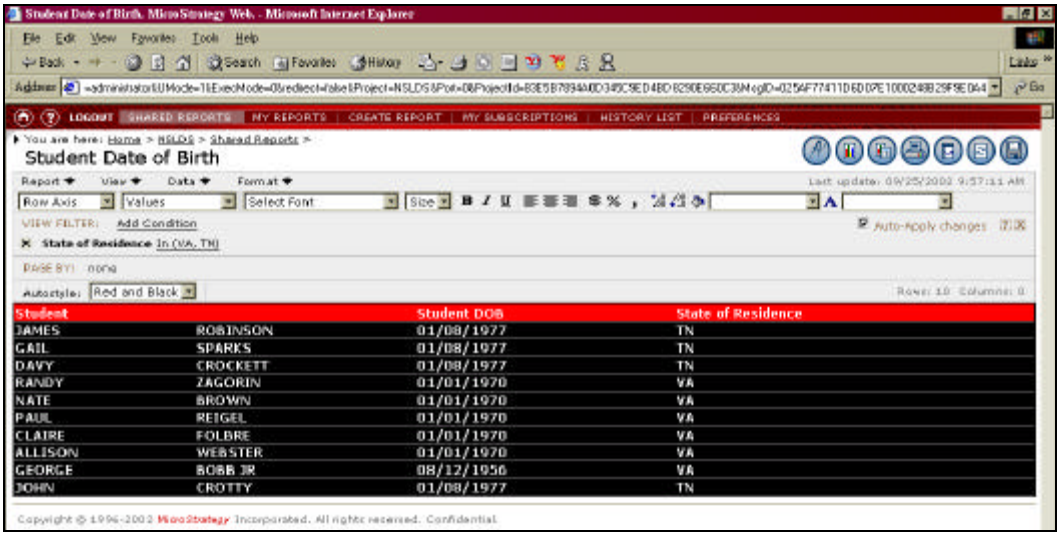


Figure 22, Report with View Filter

4.3 Adding Prompts

Prompts are used to allow the user to dynamically select filtering criteria prior to report execution. Filtering criteria are determined by the user's answers to a list of prompt questions before submitting the report for execution. Thus, prompts provide flexibility in the filters that are applied to a report.

Users of the NSLDS II project will have the ability to add defined prompts to a report when developing a new report. Prompts are accessible in the design mode by navigating to the **Prompts** folder in the **All Objects** tab.

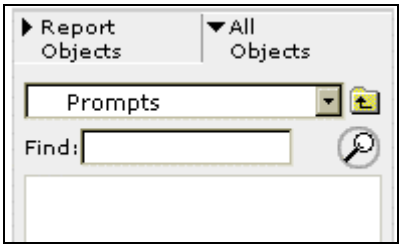


Figure 23, Prompt Folder

To add a prompt to a report, click on the prompt name link in the **Prompt** folder.

The prompt will be added to the report.

4.4 Running Reports with Prompts

If reporting prompts have been added to a report, the user will need to answer the prompting questions before the report request is submitted.

The following figure shows an example of a report prompt. For this example, the user is asked to select one or more GAs from a list of Guaranty Agencies. Only information related to the agencies selected will appear on the report.

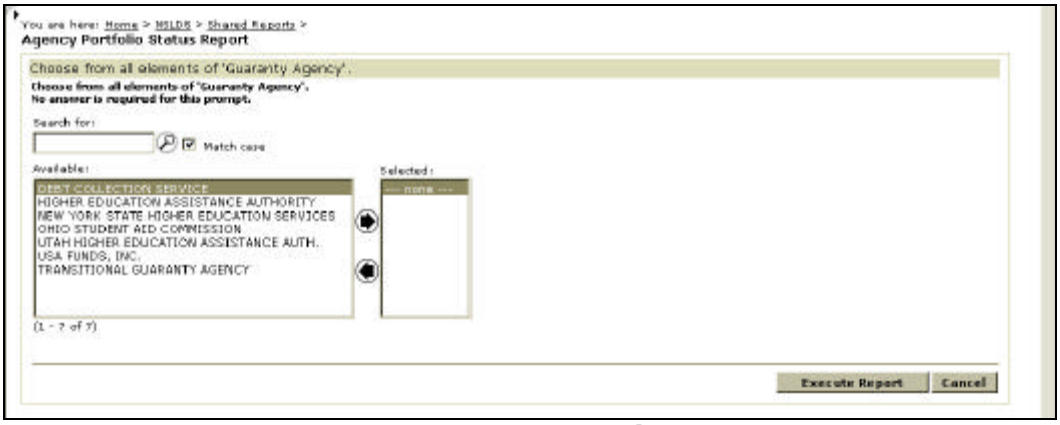


Figure 24, Prompt Window

For this example, three Guaranty Agencies will be moved from the **Available:** box to the **Selected:** box using the arrows between these two boxes. When the desired elements appear in the **Selected:** box, click on the **Execute Report** button.

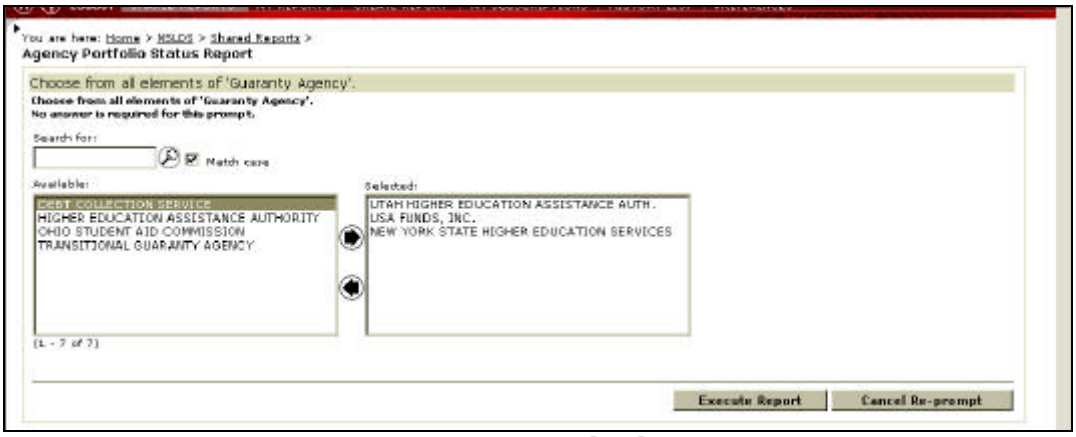


Figure 25, Prompt with Selections

The report, adhering to the user-created filters, will be displayed.

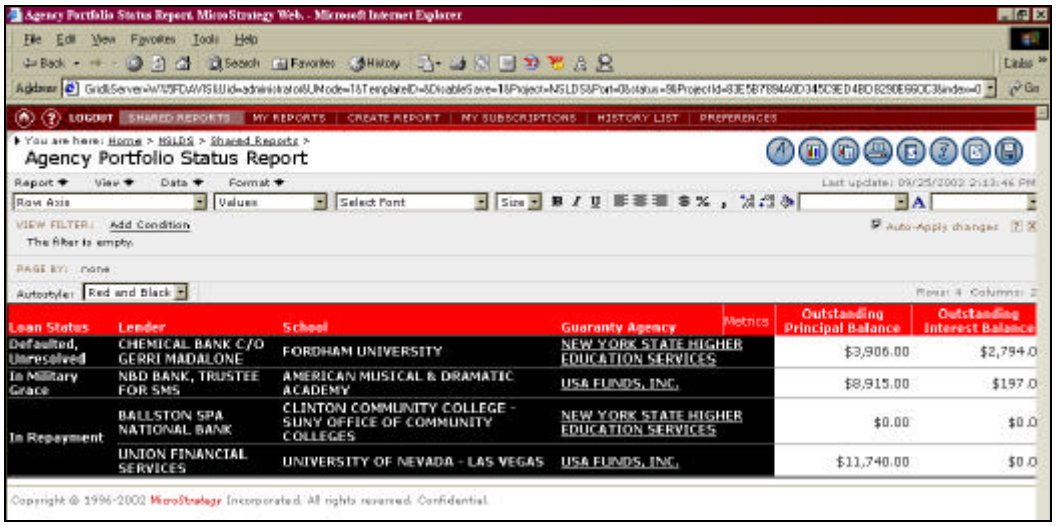


Figure 26, Report Results

4.5 Manipulating Reports

The NSLDS II web environment supports an array of report manipulations. This section gives a high-level description of key functions available while viewing reports in the NSLDS II project.

4.5.1 Drilling

Drilling allows the user to see data at levels other than that of the original grid or graph. Drilling allows the user to drill on the entire report or only on part of a report. When a user drills on a report they are moving to a new level in the logical hierarchy. A hierarchy is defined as groupings of attributes that reflect their relationship to other attributes. For the NSLDS II project, a potential hierarchal path would be **Region** to **State** to **School** to **Student**. If drilling capabilities along this hierarchy were enabled during the design of a report, a user could view a

report that displayed schools with their corresponding loan balances and then drill down to each individual student that had a loan at those schools.

School	Loan Balance
State University	$20,000
Smith College	$21,000

Table 1, Initial Report

School	Student	Loan Balance
State University	Davy Jones	$10,000
	James Thompson	$10,000
Smith College	Steven Ambrose	$8,000
	Leon Miller	$9,000
	Walter Creeds	$4,000

Table 2, Drilled Report

There are two methods to drilling on a report: left-click and right-click drilling.

Left-Click Drilling

Left-click drilling enables the user to drill down one level on one report element only. In the example report below, notice that the **Country** column is hyperlinked. If the user clicks on the 'USA' hyperlink, the report will drill down to region, the next logical tier in the hierarchy. The hierarchal path for this example would be **Country** to **Region** to **Call Center**.

Country	Category	Year Metrics	2000 Revenue	2000 Profit
USA	Books		$ 3,762	$1,001
	Electronics		$ 702,185	$192,719
	Movies		$ 169,485	$41,879
	Music		$ 169,566	$18,645

Figure 27, Left-Click – Initial Report by Country

Once the user selects the column to drill on, the report will refresh with the results displayed.

Region	Category	Year Metrics	2000 Revenue	2000 Profit
Northeast	Books		$ 5,015	$1,325
	Electronics		$ 825,776	$225,749
	Movies		$ 199,059	$49,210
	Music		$ 201,139	$22,188
Mid-Atlantic	Books		$ 6,771	$1,808
	Electronics		$ 1,196,217	$327,118
	Movies		$ 288,814	$71,430
	Music		$ 292,820	$32,185
Southeast	Books		$ 3,762	$1,001
	Electronics		$ 702,185	$192,719
	Movies		$ 169,485	$41,879
	Music		$ 169,566	$18,645
South	Books		$ 2,942	$786
	Electronics		$ 495,187	$135,492
	Movies		$ 115,309	$28,520
	Music		$ 114,242	$12,492

Figure 28, Left-Click – Drilled Report by Region

Any hyperlinked column can be drilled upon.

Right-Click Drilling

Right-click drilling enables the user to drill to multiple levels on the report element. For example, a user could drill up a hierarchy or down several levels in the hierarchy. When a user right-clicks on an attribute a pop-up menu will display. This pop-up menu displays the different drill paths, depending on the attribute selected.

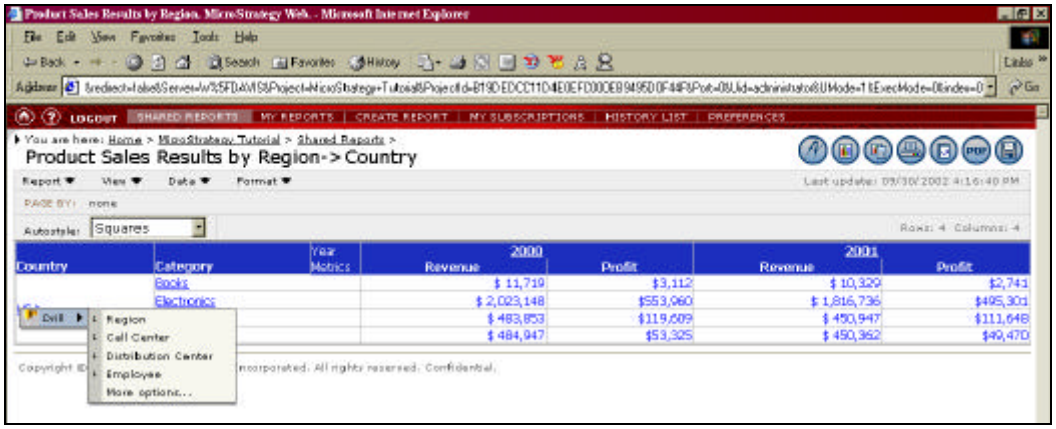


Figure 29, Right-Click Drilling

In the preceding figure, the **Country** column can be drilled to **Region**, **Call Center**, **Distribution Center**, and **Employee**. In this menu beside the attribute, an arrow pointing up or an arrow pointing down will be shown. An up arrow indicates the report will be drilled up in the hierarchy, a down arrow indicates the report will be drilled down in the hierarchy. For example, drilling up from **Region** would display the report at the **Country** level, drilling down from **Region** would display the report at the **Call Center** level.

4.5.2 Page-by

A page-by enables the user to select and display subsets of the report data as separate pages. This feature is most useful on extremely long reports where downward scrolling is necessary to see all of the data.

To implement a page-by, the user would drag the appropriate column header into the **Page-By** panel on the report screen. For the figure below, the attribute **Region** has been dragged into the Page-By panel to divide the report into multiple pages.

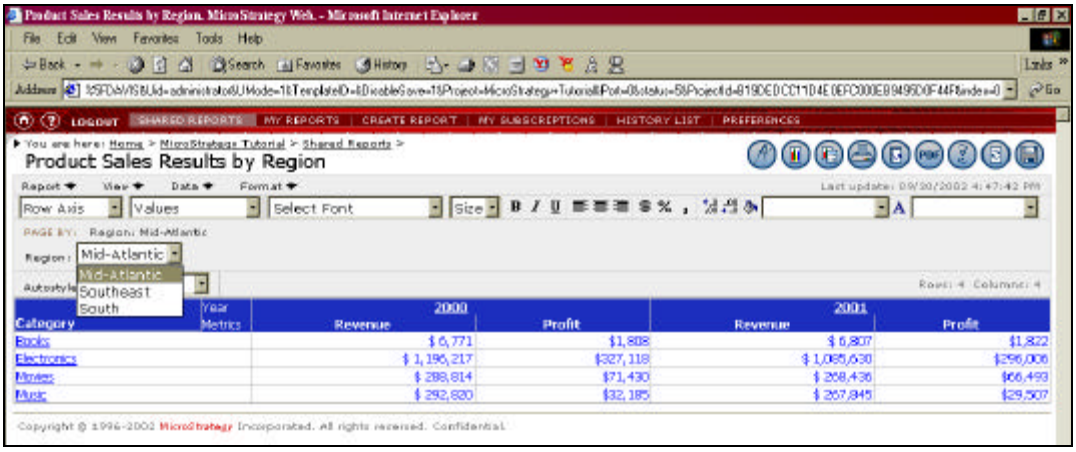


Figure 30, Page-By

A user selects a Region from the Region dropdown inside the Page By panel. Once a Region is selected, the report will automatically display the appropriate results. It is possible to include more than one attribute to page by. This can be useful when using reports that have extensive amounts of information.

4.5.3 Data Pivoting

Data pivoting allows the user to rearrange report columns and rows within a report in order for the data to be viewed from different perspectives. Pivoting can be done in three ways. It can be done by right clicking on the row or column, or by dragging and dropping the row or column to its destination, or by using one of the pre-defined pivot buttons. Users can pivot on the column axis, row axis, the page axis, which is a page by, to move the data up, down, left, and right.

To display the pivot buttons, select **View** from the report toolbar, then click on **Show Pivot buttons**. To remove the pivot buttons from the report screen, click on **Show Pivot buttons** from the **View** menu.

Data Pivoting Buttons

Name	Button	Description
Move to Row		Moves a selected object from the columns to the rows.
Move to Column		Moves a selected object from the rows to the columns
Move Up		Moves the selected object up.
Move Down		Moves the selected object down.
Move Left		Moves the selected object left.
Move Right		Moves the selected object right.
To Page Axis		Moves the selected object to the Page By panel.

4.5.4 Sorting

Sorting allows the user to specify the order in which the data for a particular report will be presented, in either ascending or descending order according to specific rows or columns. There are two sorting options: quick sorting and sorting using the sort panel.

Quick Sort

Quick sorting allows the user to select a row or column and use it to sort the report in ascending or descending order. To display the quick sort menu, right click on the desired row or column, select **Sort** from the list and then select either **Ascending** or **Descending**. The report will refresh showing data arranged by the selected sorting option.

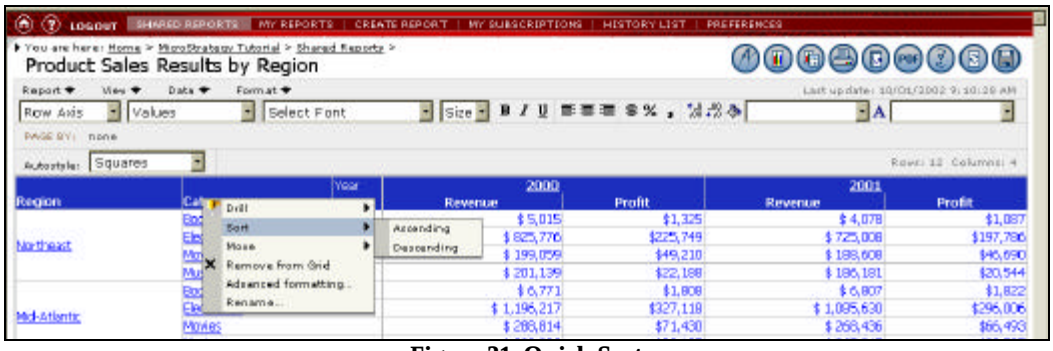


Figure 31, Quick Sort

Sort Panel

The Sort Panel allows the users to create more advanced sorts, columns, and pages. The sorting criteria do not have to be displayed on the report. This option is available in both Grid and Graph view. Every report element that is displayed on the report will be available in the sort panel dropdowns.

To display the Sort Panel, the user would click on the **Data** option on the report toolbar and then select the **Sort…** option. The Sort Panel will appear. The user can then select the order by which the data should be sorted.

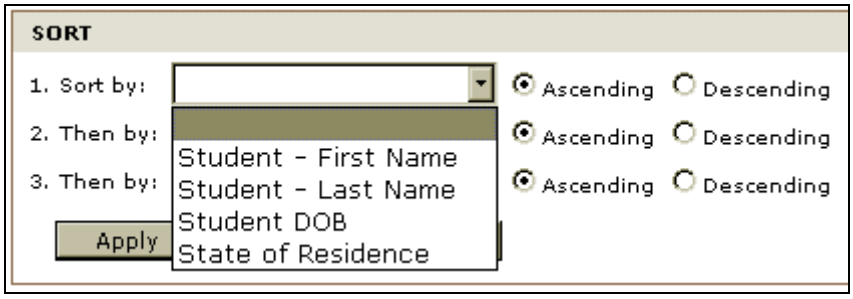


Figure 32, Sort Panel with available Report Elements

To apply the selections made in the Sort Panel, the user would click on the **Apply** button. The data will refresh showing the data arranged by the selected sorting options.

4.5.5 Formatting

Although default formats are used when reports are generated, these defaults can be changed and saved at any time. Formatting allows the user to format cell fonts, numbers, borders, and alignments. When a report is saved with a customized format, this format will automatically be used when the report is generated again.

Format Toolbar

The formatting toolbar allows the user to quickly format rows and columns that are on a grid report. The ability to change font, alignment, number display, and colors objects are available

using this toolbar. To display the formatting toolbar, the user would select **View** from the report toolbar, then **Toolbars**, and then **Format**.

Figure 33, Format Toolbar

Advanced Formatting

Advanced formatting allows the user to format specific rows or columns in a more detailed manner. To display the Advanced Formatting panel, the user would right click on either a row header or column header and select the **Advanced Formatting…** option.

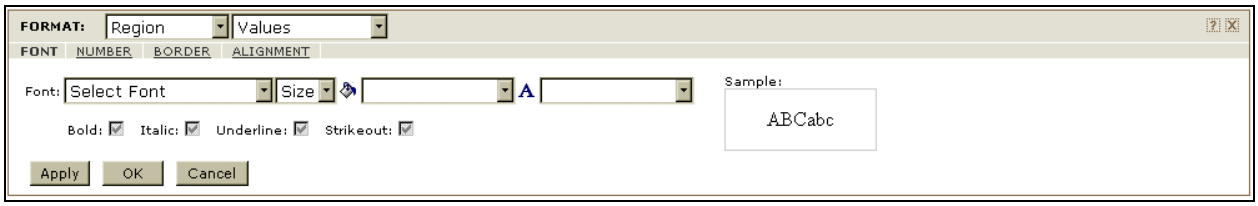


Figure 34, Advanced Formatting Toolbar

This panel has four tabs that correspond to specific functions. The **Font** tab controls the type, color, size, and background of the font. The **Number** tab enables the user to choose various number formats that can be applied to numeric values on the report. The **Border** tab allows customization of report gridlines. The **Alignment** tab positions selected text either horizontally or vertically.

Once the formatting settings have been adjusted, the user would click on the **Apply** button to implement the formatting changes.